Cost reduction using transaction management: a complement to Lean management

den Butter, F.A.G.

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Cost reduction using Transaction Management: a complement to Lean Management

Frank A.G. den Butter[1]

Abstract

Lean management and transaction management offer complementary perspectives on cost reduction to the business organization. Lean management focuses on preventing waste in production and is drawn from the business practice. The focus of transaction management is a reduction of transaction costs in the internal and external organization of the firm. The emphasis is on value creation on the long run. Transaction management is based on the theories of transaction cost economics and the new institutional economics. From these theoretical perspectives, with tree Nobel prize winners as originators (Coase, North and Williamson), it may contribute to the strategic management of the firm.

Keywords: transaction cost economics, Lean management, strategic decision making, globalization, outsourcing, procurement

JEL-codes: L14, L23, M11

[1] Professor of Economics, VU University Amsterdam, De Boelelaan 1105 (room 2A38), 1081 HV Amsterdam, tel. +31 205986044; fax +31 5989870; email fbutter@feweb.vu.nl. A major research interest of the author is to make the theory of transaction cost economics operational for practical applications in B2B and G2B relationships. This article benefitted from useful remarks by a referee of this Journal and is partly based on Boons and Den Butter (2011)

1. Introduction

The well established technique of Lean management and the newly developed methodology of transaction management both aim at cost reduction. The main orientation of Lean management is the business practice. The emphasis of this technique is on cost reduction and value creation by enhancing the efficiency of production processes. Transaction management also seeks to keep costs as low as possible, but from a different perspective. It focuses on the transaction costs that the coordination and organization of production bring about. In this era of globalization where the production chain is split up further and further - the fragmentation of production – transaction costs become increasingly important. This is particularly true for those firms which are to fulfill the role of organizer and orchestrator of production to. This aspect of globalization, where trade in products is more and more replaced by trade in parts, components and tasks (Grossman and Rossi-Hansberg, 2008), illustrates the growing importance of transaction management. It does not only relate to the organization of the value chain within firms – the internal organization of the firm- but also and most prominently to the external organisation of firms and production processes. In addition transaction management also provides a more general strategic view in which a balancing of costs in the short and long term plays a central role. Transaction management can also be applied in government organization, and accordingly in G2B and in G2G relationships. While Lean management primarily focuses on how to set up and organize production processes, transaction management is first and for all directed at the organization of the firm and at strategic decisions with respect to the position of the firm in the value chain. Yet, as far as Lean management is also concerned with these aspects from the perspective of cost reduction, the two approaches may overlap. There is no clear dividing line between the two approaches.

The "Lean management" philosophy originated with Toyota in the automotive industry but is now also used in many other industries. Lean management is very much customer oriented. It helps to optimize the entire production chain, where as many as possible components of the chain, and transitions in the chain, which do not directly contribute value to the customer, are removed. Moreover, production processes which are designed according to the principle of Lean management provide the possibility of taking the wishes of the customer's into account, without parting from the principle that products should be based on combining a limited number of standardized parts.

Transaction management has a different background (Den Butter, 2011). The origin of this methodology lies in what is nowadays regarded as main stream economic theory. It combines elements of the theory of the firm, industrial organization, international economics and institutional economics. The core economic theory behind this approach to management is the new institutional economics (see Ménard and Shirley (eds.), 2005). Transaction management provides a sequel to the long tradition of the Netherlands as a trading nation (WRR, 2003), which succeeded through good trading skills to keep transaction costs low and hence create value in trade. Yet, this skill for

value creation is also relevant for other nations such as Belgium, Switzerland and Singapore, which can be characterized as transaction economies as well and fulfill an orchestrating role in the world of today. For such transaction economies it is important to be innovative and create knowledge on how to further reduce transaction costs. In that sense, transaction management can be seen as a method inspired by economic theory that provides knowledge for practical applications in strategic decision making.

This article discusses how combining the perspectives of Lean management and transaction management can contribute to a better internal and external organization of firms and add value in this era of ICT and globalization. This is done through a discussion of the key aspects of both methods and an assessment of cases. As Lean management is established and well documented in business management literature, the focus of the article is on how transaction management, which is far less documented, can be useful as a complementary approach.

2. Lean Management

Lean is a label for a philosophy also known as the Toyota Production System (TPS). In the 1980s, it was discovered that Toyota scored significantly better on a number of aspects of efficient production than the Western automobile industry did. For example:
• there was less effort required to design, manufacture and sell its products;
• there were fewer accidents;
• fewer investments were needed to achieve a certain production capacity;
• there were fewer faulty products produced;
• the required stocks were lower; and
• the cycles of “concept-to-launch”, “order-to-delivery” and “problem-to repair” were shorter.

Lean is often linked to the smart organization of production. Yet Lean focuses on the entire value chain. In that sense, it is a philosophy that focuses on providing added value for customers by eliminating all forms of waste. The category "muda" is for most people the most recognizable form of “waste”. Muda includes waste because of:
• Transportation
• Waiting
• Overproduction
• Defects
• Relocation
• Stocks
• Additional processing

Yet mura (unevenness) and muri (overburden) can also be considered important sources of waste. Mura comprises all efforts, such as quality control, that arise because the quality of a product is not predictable. Muri involves the utilization of human effort and machines above or below their capacities.

Various management tools are useful when a firm decides to embrace the Lean philosophy. Important in this respect are value stream mapping and Kaizen. Value stream mapping is used to analyze a process to detect forms of waste. This relates not only to the flow of goods, but also to the stream of information. Kaizen means continuous, gradual improvement, which is a typical Oriental approach to changing an

organization. In this respect Kaizen, and in a more general sense, Lean management is also concerned with aspects of human resource management (HRM) (see Beauvallet and Houy, 2010, for a survey). The name Lean management does not come from Toyota itself. The term "Lean" was first used by Krafcik (1988), and it should be noted that the idea of Lean manufacturing actually goes back to the introduction of mass production lines of cars by John Ford. Ford foresaw the importance of not wasting materials during production and organizing production efficiently by assembling standard components. The difference between the static conceptions of Ford and the more modern way of organizing production according to the principles of Lean is that nowadays production takes place in a much more dynamic environment where rapid responses to changes in customer preferences and the flexibility of the production process are essential.

Lean and Six Sigma

Lean management includes different perspectives on the organization of production. One example is the integration of Lean with Six Sigma (Arnheiter and Maleyeff, 2005). Six Sigma was developed by Motorola and has since been applied by many US companies including General Electric and Allied Signal. The concept of Six Sigma is that in assembling products from many different parts, the quality of the product depends on the probability that one of those parts does not function properly. In cases of defects in the weakest links in production, the tolerance for error margins of those components must be much smaller than the usual twice the standard deviation (2σ). When the tolerance is reduced to six times the standard deviation (6σ) and thereby higher quality standards are required for the components in the production than are often supplied by others, the costs of failure due to product failure will become considerably less. In that sense, Six Sigma complements Lean management because it strives to lower the costs of failure as much as possible.

3. Transaction Management

The purpose of transaction management is value creation, both for individual firms and for society as a whole, by keeping the costs of trading as low as possible. It is a new name for something that trading nations have traditionally been good at. In this sense, transaction management becomes increasingly important in this era of globalization. After all, globalization implies that more and more the benefits of economics of scale and of specialization are exploited on a world wide scale. The production chains are split up in numerous parts and these parts are produced in those places of the world where production costs are lowest. Country borders are no longer relevant so that trade in products and services gets more and more an international character. This leads to an enormous increase in trade, both between and within firms.

Because of this specialization and global outsourcing of jobs, there is a greater need for coordination. *Transaction management provides insight into how these coordination costs (or transaction costs) can be minimized*. In other words, transaction management shows how cultural differences, differences in laws and regulations, in work ethics, in quality control and in government regulation can be dealt with at lowest costs. Through computerization, reduction of transport costs and reduction of formal trade barriers the world seems to have become "flatter" (see Friedman, 2005). Indeed, these “hard” and visible transactions have gradually decreased. That is the engine of the current

globalization. In contrast, however, there are "soft" and far less visible transaction costs. Transaction management focuses primarily on reducing these soft transaction costs.

Hard and soft transaction do not only play a role in the usual commercial transactions involving trade and therefore change of ownership of goods or services. In case of hiring personnel transaction costs are also important: think of search costs, information costs, application fees, costs of getting acquainting with a new job, severance costs and all costs of the personnel department, including advertising costs. After all, a contract is in a sense a form of transfer of ownership of an employee to his or her boss. Moreover, marketing costs and information costs can also be regarded as part of transaction costs. Within firms are all kinds of team meetings to discuss coordination and sharing out of work, regulatory and internal compliance costs and so on, can be seen as transaction costs.

The economic theory of transaction costs

The role of transaction costs in economics is well established: three economists have been rewarded the Nobel Prize for Economics for their contribution to the theory of transaction costs, namely Coase, North and finally Williamson in 2009. Coase (1937) formulated the first ideas about it more than 70 years ago. The reason for Coase to consider transaction costs was to explain why firms of any size do exist in a world where the invisible hand of the market mechanism provides an optimal allocation of goods and resources. The reason is that the allocation of goods through market trade brings about all kinds of transaction costs. According to Coase, firm size depends directly on the nature of the transaction. In the case that the (marginal) transaction are higher for exchange within the hierarchy than for exchange through the market, it is obvious that parts of the firm are to be split and benefit from lower transaction costs of trade through the market. The firm size then decreases. The opposite - transaction costs are lower in the hierarchy than through the market - provides an argument for an expansion of the firm.

The economic theory of transaction costs has subsequently been implemented primarily by Oliver Williamson, who defines transaction costs as the costs of running the economic system. Williamson (1999) explicitly discusses the link between transaction cost economics and management and organization theory, although not giving it the name of “transaction management”. The upshot is that firms and markets are alternative modes of governance. In this sense, transaction management can be regarded as a methodology to make the management of the firm decide about the best way of exploiting these alternative ways of governance. In the case of technological nonseperabilities it is better to organize production within the hierarchy, but when there is a possibility to separate the production process in various parts, outsourcing of some of these parts may be the lowest costs’ option. In other words, transaction management is concerned with the optimal way for a firm, or more generally, for a hierarchical agency, to solve the coordination problem. This includes not only the internal organization of the firm or agency, but also the external organization. From the perspective of strategic management of a firm it is the positioning in the supply chain that matters. In that respect, the "make or buy" and location decisions when outsourcing of parts of the chain is considered, play an important part.

A central notion in the work of Douglass North (1991) is that the ongoing interaction

between rules and players, or between institutions and organizations, underlies the success or failure of an economy. He emphasizes in this context the importance of institutions. That is why transaction cost economics is linked with the theory of (new) institutional economics. Institutions in the sense of North do not only include formal institutions, such as legal rules and regulations. Informal institutions are very important as well, or even more so. These include socio-cultural phenomena such as the prevailing values and norms, mutual trust, and the commercial or mercantile skills of a nation. This is where the "soft" transaction costs come into the picture. These soft transaction costs can be reduced by building up a reputation of trustworthiness. Moreover, in order to be able to coordinate in the modern society, it is crucial to have good technological and organizational knowledge about the trading conditions and the parts of the supply chain to be connected. That is where transaction management and innovation come together. Innovation and thus productivity can be enhanced by knowledge of the relevant networks and by a good organization of creativity. Value creation is mainly the result of exploiting the fruits of cooperation. From this perspective transaction management can also be seen to as the skill of establishing valuable connections.

Greif (1993, 1994, 2000) has shown that institutions play a crucial role in order to satisfy the basic condition for exchange, namely to be able to commit to a trade contract. Institutions are a solution to the “game of trust”, which is needed to make contracts enforceable. In the early Middle Ages Jewish merchants - the "Maghribi traders' – were bound to keep their promises on trade agreements through family ties and other social networks, even though their deeds could only be controlled much later because of the large distances and travel times. Later, this institutional system of using family ties was replaced by legal systems as institutions.

4. Transaction Management with a complementary role for Lean Management

While many practical examples of application of Lean Management are available from the literature, for transaction management that is much less the case. This section briefly discusses two case studies of transaction management and indicates how Lean management could have fulfilled a complementary role in these cases. The cases are: (i) a strategic consulting exercise for IHC Holland Merwede, in order to become a leading orchestrator in the international dredging cluster (Den Butter and Leliefeld, 2007), and (ii) a discussion of the growing strategic role of procurement in the era of globalization (Den Butter and Linse, 2008).

The case of IHC Holland Merwede

IHC Holland Merwede (IHC) provides a good example in the manufacturing industry of how a company which was oriented to sheer production, is transforming to an orchestration function with a significant technological component. The company has its customers in the dredging, specialized shipbuilding and offshore industries and offers them advanced and efficient technological solutions. IHC specializes in designing, building and installation of dredging equipment. Moreover, IHC supports the use of the equipment for end users throughout the whole product "life cycle". This means that IHC also provides maintenance, repair and supply of parts for its customers in the worldwide operating dredging industry. In that respect the company plays a major role in the risks that its customers take in their dredging contracts. The dredgers strongly

benefit from the reliability of their equipment and want these capital goods to be in use continuously. Because of the high specialization in a very specific product segment IHC takes a special position in the Dutch shipbuilding industry. As the prospects are favourable for the dredging industry - think of the growing need for ports and waterways and the increasing extraction of minerals from the seabed – IHC may in future expand its position of orchestrator of supply and maintenance of this dredging equipment.

Therefore the need arises for IHC to act more on a worldwide scale as orchestrator because in the future it can to a lesser extent rely on today's clustered location of the sector in the Netherlands and Flanders with 4 big dredging companies (Boskalis, Van Oord, Jan de Nul and DEMA). Nowadays the relationships between these firms in the cluster are strong and trust is high. The common language, culture and physical proximity so far favoured the design and implementation of innovations. Given the low likelihood of free ridership and of a hold up, there was a good understanding of the mutual needs without leading to duplication. So in that sense the cluster has been instrumental in reducing transaction costs. In the case of IHC it is also related to the technological advantage obtained on direct competitors. The shipbuilding industry and, more generally, the total metal using sector, however, are under increasing pressure. It will certainly affect the future development of the dredging cluster. The main change is that the labour-intensive, low-skilled production increasingly will be placed outside the Netherlands and Flanders, while complex, capital intensive processes become more important. Moreover, the nature and origin of demand is changing. In general, this change brings about that risks are playing an increasingly important role for the customers of IHC (the dredgers). Although the dredgers were already executing projects all over the world, they are increasingly dependent on innovative projects in Asia and South America at the expense of more mundane European projects. Projects in Asia also involve many complex forms of cooperation with local authorities and contractors, whereas at the same time the dredgers are confronted with an increasingly fierce competition in the dredging industry. Therefore, on the one hand it is necessary for the dredgers to maintain technological leadership, but on the other hand it becomes more and more harsh to offer a proper value for money in order to win tenders.

Given this starting position and views about the future, it is necessary but also a challenge for IHC to respond to the new positioning in the market and industry. In order to meet this challenge the company could in the future specialize through two business units, namely:

- control of transaction costs for suppliers and
- control of transaction costs for customers.

The first function for IHC to focus on, the control of transaction costs for the *suppliers,* implies providing assistance to providers who are considering moving their production elsewhere at home or abroad. IHC itself has several times completed this step successfully and avails of sufficient specialized knowledge to judge these kind of transactions on their ability to create value. Such operations bring about large, specific risks. First there is the risk that contractors, when contracts are signed, will have less incentives to deliver at unchanging prices and comply with the contract (moral hazard). Second there is the risk that production parts are outsourced to subcontractors for wrong reasons (adverse selection). A good risk assessment, and reduction of risks is

only possible in a situation with such dilemmas when there is a sufficient scale in terms of internationalization and knowledge of local conditions. Those companies who have this knowledge and scale, in this case IHC, can grasp the surplus through the internalization of the risks, while at the same time serving the other firms (customer and local contractor). This will then further establish the role of IHC as orchestrator by being trusted in the sector and by enhancing its reputation as a trading partner.

The second function for IHC to focus on, the control of transaction costs for its *customers,* implies that the company should, in a smart way, be responsive to the needs of the dredgers. The division "Parts & Services" of IHC already plays that role to a major extent. Not only does IHC build and install instruments for its customers, the company also provides training for those responsible for the operation and maintenance of the tools. Moreover, new parts for the dredging instruments and repair are provided by various service centres around the world. The essence of this function is similar to that as the transaction cost control function for the suppliers. The person or firm that has the most knowledge of the risks should become owner of the risks. In this way value can be created through this knowledge on how to reduce risks. IHC may, in the future, further exploit this knowledge by financing of the supply of equipment. For example, risks can be managed by IHC through leasing contracts. This form of transaction management reduces transaction costs throughout the sector and hence will again contribute to the trust and reputation of IHC.

This transaction management of IHC with respect to both procurement from suppliers and customer demand provides an excellent example where insights from Lean management can be complementary. That is because Lean management is also concerned with cases where benefits from outside the organization are to be collected. It such cases a firm will enter into strategic alliances with a limited number of suppliers and customers (Piercy and Rich, 2009). Then, these suppliers and customers must be involved in the Lean philosophy of the organization. Dyer et al. (2001) studied the success factors for an effective strategic alliance. The main conclusion is that someone just below the top of an organization should be appointed to deal with such strategic alliances and be partner in all strategic discussions of the firm. A target for strategic alliances within the Lean philosophy (Dyer et al., 2001; Piercy and Rich, 2009) is to reduce transaction costs for both suppliers and customers. Obviously, this literature on strategic alliances implicitly makes a connection between Lean management and transaction management (see also Dyer, 1997). Additionally, Dyer and Nobeoka (2000) show that Toyota itself as the birthplace of Lean management, was able to save on costs by knowing how the network of suppliers should be organized in order to enhance the efficiency of production (see also Dyer and Hatch, 2006).

Both business transaction functions (for suppliers and customers) for IHC will not only lead to new knowledge on how to organize production in both markets, but can also (through the obtained trust and reputation) bring about new contracts, both for the delivery of the dredging equipment and for the delivery of the "transaction cost services." Thus it gives rise to two upward spirals. The first relates to the reputation and trust effects. A contract, either for the supply of equipments or for the supply of a service, offers a possibility to enhance the trust and reputation of the company, which may in turn result in new orders. The second spiral relates to the position of the company in the sector as its focus on both business transaction functions will provide economies of scale in terms of the internationalization of knowledge and risk. A

contract which makes use of IHC's skill to reduce transaction costs of its clients or suppliers provides the company with new knowledge. On the other hand, because the dredging firms as clients, or the suppliers, have outsourced these production tasks and services, they will acquire less knowledge and be more dependent on IHC. This new knowledge of IHC can be stockpiled and be used again on repeat orders by IHC. This may lead to an additional demand with an increased surplus value. By using this knowledge, IHC is better able to respond to the needs in the sector, e.g. through competitive pricing of a contract.

Both spirals provide, if well organized, a continuous reinforcement of the orchestrating position of IHC in the industry. By obtaining this position, IHC can substantially boost its gains from these activities with respect to the supply and maintenance of equipment and therefore from the "transaction costs functions", because it can make use of knowledge which is superior to that of any of its competitors.

In this case of IHC transaction management is much concerned with the transition of the company to a functioning of worldwide orchestrator in the dredging industry. Therefore the focus is on the external organization of the company. Here the contribution of Lean management can be complementary and, apart from the discussion on strategic alliances, be concerned with avoiding unnecessary costs in the internal organization of IHC. Moreover, the transition towards orchestration also brings about the need for a change in attitude within the company. Here using the concept of Lean management can be helpful to confine as much as possible the transition costs in this process of change. It is especially the concept of Kaizen, which is related to HRM, where Lean management can contribute to a smooth transition in line with the strategic changes suggested by transaction management.

The case of procurement

Procurement provides an exemplary aspect of running a business where transaction costs play a major role. Over the past 25 years, the role of procurement within firms has changed dramatically from that of simply buying goods and services to overseeing an integrated set of management functions. Procurement has crept into every aspect of management, from category management to managing supplier relationships, to contracts and payments, to strategy. As firms look beyond short-term costs and the scope of procurement-related issues has grown, procurement professionals are paying more attention not just to what they spend on goods and services but to the broader costs of operating, maintaining, and replacing the items and resources they purchase over time. In other words, whereas procurement could originally benefit much from Lean management techniques in order to reduce costs, in this broader perspective also lessons from transaction management are to be learned.

Despite procurement's increased level of importance, it has yet to achieve the level of high-level recognition it deserves. There are two main reasons for this. First, it is often difficult to document procurement's specific contributions: were the cost savings the result of skilful negotiations with vendors or of a fortuitous shift in the market? In addition, the financial benefits of a favourable procurement deal often extend beyond the initial purchase price to other aspects of performance (for example, improved working capital, or reduced financing costs), so there is more than one bottom line to consider. Second, the line between the responsibilities of procurement and those of

other stakeholders can be ambiguous. The result is that the role of procurement in the general strategic management decisions of the firm is not fully understood and appreciated. Consequently procurement often shares whatever successes it achieves with other groups; for failure, however, it typically gets all the blame. This undervaluation of the importance of procurement may, in the end, enhance transaction costs for the firm.

Procurement professionals have an essential role to play in managing the complex interface between firms and stakeholders to maximize value. In today's transparent global economy, procurement managers will have to identify and manage not only the different sources of transaction costs. They will need to do this in areas where they have varying degrees of control or influence. To assist management in understanding its cost exposure, it is, from the perspective of transaction management, helpful to consider transaction costs along two dimensions:

1) in terms of objective and subjective issues;
2) in terms of internal and external influences:

Objective and subjective issues. Objective issues are tied to measurable factors and are of a technical or professional nature. They are usually linked to financial issues such as direct costs, improved quality, on time delivery, transportation cost, and life-cycle cost. Subjective factors, by contrast, are related to emotional, religious, or intuitive views about the world and how it connects with the organization. Although not overtly related to finance, such issues (for example, unethical business behaviour, diminished confidence in a brand, or adversarial labour relations) can result in significant transaction costs and have major financial implications.

Internal and external factors. Internal factors are factors related to the specific business: its market position, and its reputation and brand. These are distinct from external factors, which are tied to developments outside the company in areas such as regulation, labour costs, and currencies.

The combinations of internal, external, objective, and subjective factors create a complex spectrum of exposures that can affect the financial health of a company, if not its very existence. In a global economy, knowing the risks and opportunities of the different exposures is a critical management competence. Although management decisions will originate in many different parts of the company, procurement managers will need to keep a close eye on the various cost exposures and flag concerns as they arise. Procurement, therefore, will need to become more closely connected with strategic decisions throughout the company. That is exactly what transaction management prescribes.

Table 1 lists the various types of costs that need to be considered in today's procurement decisions. The table distinguishes between on the one hand the objective and subjective factors which bring about procurement costs, and between on the other hand the internal factors, which can be influenced by procurement or strategic policy of the firm, and the external factors which are exogenous to the firms decisions. It emphasizes the role of transaction costs, especially "soft" transaction costs. As mentioned before, these costs are becoming increasingly important and have made procurement an essential part of strategic decision-making at global companies.

Table 1 Classification of costs in procurement

Objective ("hard") Factors	Internal Factors (decisions within company control)	• Search and information cost connected with identifying suppliers • Direct cost of acquisition • Transport cost • Quality assurance • Installation and maintenance cost • Intellectual property costs • Training
	External Factors (decisions controlled by others)	• Legislation in relation to trade • Currency effects • Import/export permits, levies • Labour costs and safety standards • Government rules and regulations
Subjective ("soft") factors	Internal Factors (decisions within company control)	• The effect of sourcing decisions on existing jobs • The effects on reputation and brand value • Corporate culture: Will staff support new suppliers? • Sustainability tradeoffs inside the company • Risk aversion: Will staff be able to deal with the risks associated with new supply options? • Internal ppp considerations
	External Factors (decisions controlled by others)	• Sustainability considerations in relation to local and global economic environments • Cultural differences connected with doing business • Political differences concerning democratic rights, distribution of wealth, unions, and political stability • Uncertainty and lack of time consistency in political decision making • Customer views on desirable sources/suppliers • Social responsibility • Labour circumstances • Environment

The importance of detailing and managing hard costs on a category-by-category basis cannot be overstated. These are listed in the two upper cells of table 1. Obviously Lean management can contribute to keeping these transaction costs down. However, a major part of the globalization challenge is figuring out how to conduct business both profitably and ethically, which requires a more comprehensive understanding of how to manage the "soft" issues (for example, the trade-offs between the environment and profits). Decisions to source products offshore—for example, outsourcing parts production and services —often lead to higher transaction costs than originally expected. This has implications for regional employment and economic growth because these transaction costs may affect profitability of outsourcing and reduce economic activity. It may, moreover, lead to social unrest at home and a loss of trust in the

company, which can give rise to a *new* set of transaction costs. It is transaction management which takes these kind of costs into account as they refer to a major part to the external organisation of the firm. Therefore, in this case of procurement Lean management and transaction management are complementary in the sense that Lean management is mainly concerned with the two upper cells of the table whereas transaction management also focuses on the two lower cells. This relates to the external positioning of the firm in the supply chain and to aspects of the strategic management of the firm

As an example the external considerations in PPP (profits: shareholder's interests, people: social aspects; planet: environmental aspects) can be mentioned These different elements of what constitutes a sustainable business policy, require careful consideration by the management of the firm. Decisions on this may entail risks that, if they indeed materialize, yield high transaction costs. The extent to which a firm is inclined to run these risks, can be considered an internal factor and is therefore in the third cell of the table. Another example is that decisions to outsource work and jobs abroad, may imply the dismissal of employees in the establishment at home, which can lead to social unrest, and which in turn entails many transaction costs. In this case there are complementarities with Lean management as Lean management is concerned with the interaction between HRM and other bundles of Lean manufacturing practices, such as just in time management (JIT), total quality management (TQM) and total preventive maintenance (TPM) (see Shah and Ward, 2003). HRM should anticipate and avoid as much as possible the costs which social unrest due to sourcing decisions brings about. That is particularly important because of the spill-overs that such unrest will have to the other bundles of Lean manufacturing practices, so that it becomes more difficult to control costs with respect to these practices as well.

"Social responsibility", in the sense of being regarded as socially responsible, is an important element in the last cell of the table. In this respect, social responsibility can even be seen as a rational business strategy, and not one dictated by social commitment and generosity of businesses. Indeed, it is in the interests of the firm to foster a long-term sustainability when it can be expected that the additional costs of such a strategy in the short run will more than fully be compensated by lower costs in the long run. When a firm respects the environment and conducts a good social policy for its employees, it signals to act socially responsible. This may affect consumer preferences, such that the risk of a buyer or unwilling workers strike is avoided. Of course, these risks and theirs costs are difficult to estimate. Therefore in practice, firms make very different choices with respect to caring about sustainability and corporate social responsibility.

However, given the reasoning from transaction cost economics, it is very difficult to separate this ethical business behaviour from rational behaviour for the own interest of the firm. Reckoning with environmental issues of sustainability, or creating a good social climate and working conditions for the workforce may bring about additional transaction costs on the short run, but on the long run such behaviour may large reductions of transaction costs. Through such seemingly correct socially responsible business conduct costs stemming from adverse public opinion formation or shirking of workers can be avoided. Obviously judgements on the sizes and relative importance of these transaction costs are difficult to make, as different corporate policies between e.g. Shell and Exxon with respect to environmental sustainability. Yet, whatever the

strategy and rationality is, socially responsible conduct will also contribute to the concerns of Lean management to keep internal production costs as low as possible.

5. Lean Management with a complementary role for transaction management

The previous section indicates how Lean management may have fulfilled an additional role in cases where the major arguments for proposed strategic decisions stem from transaction management. Likewise an additional contribution of transaction management seems conceivable in cases where the original focus is on application of Lean management. The following discusses a number of case studies from the literature on Lean management where there seem to be close links and overlap with transaction management.

For this discussion it is important to note that the specificity of the production process or service is an important concept in the theory of transaction costs. This "asset specificity" refers to the degree to which the transaction costs incurred in the first transaction do not have to be re-incurred in subsequent transactions. This applies to the exchange of goods or services that have specific characteristics. For example, in the case of outsourcing tasks, when these specifications have been established and approved in a first round, less detailed supervision for the next round is needed so that transaction costs now are lower. This can be seen as a process of learning. However, the more goods or services are tailored to the individual needs of the buyer, the higher asset specificity is. Thus, asset specificity also determines the extent to which trading partners are bound to lasting relationships (Williamson, 1985). If there is no asset specificity there is free entry to markets for such goods or services, and traders will not be interested in investing in mutual relationships. The degree of asset specificity is a major determinant of transaction costs and, consequently, how transaction management can create value.

In addition, there is a relationship between asset specificity and standardization. Uniform standards ensure that suppliers and customers become less dependent on each other and from that perspective reduce transaction costs. By contrast, the requirements in the case of the supply of parts, components or tasks can be specific to a particular situation, so that standards are developed for that situation only. This makes the mutual investment costs, which the supplier and customer have to make in their relationship, bigger. In this respect, asset specificity also plays a prominent role in the strategic alliances of a firm with its suppliers, as discussed earlier in the IHC case. Choi and Krause (2006) define the *supply base* as the portion of a supply network that is actively managed by the buying company and show that the complexity of the supply base is key in the external organisation of the firm. Reduction of supply base complexity, for instance by standardization, may reduce transaction costs. On the other hand, too much reduction of complexity may affect the competitive position of the firm, as asset specificity can be associated with innovative product development.

Case studies of Lean management from the literature show that that asset specificity – although not in this exact wording – plays an important role in this methodology as well. Bruce et al. (2004) describe the strategies of four firms from the textile and clothing industry. These firms operate at submarkets, which differ in the degree that the needs of customers are to be met. In general, the market for clothing is characterized by short product cycles and a changeability of the client where impulse buying behaviour and a

quick response to the latest fashion trends are major features. This implies that the clothing industry must be able to respond quickly in their production lines to rapid developments. Moreover, these production lines may entail many links in a fragmented production chain. The required response time for each producer depends on the specific market characteristics. A firm that serves traditional clients is able to outsource parts of the production process to low-wage countries. The additional time and effort associated with this outsourcing is compensated by the gain from lower manufacturing costs. In addition, contacts with suppliers in the home country are kept up for the development of new clothing and fashion to comply with the more sensitive parts of demand. For another firm, however, the gains from lower production costs by outsourcing to low-wage countries does not compensate for the loss of response time to new developments in fashion. This firm focuses on the upper segment of the home market where tastes change quickly. Finally, there is a firm that is particularly keen on maintaining contacts with reliable suppliers so that communication and coordination when adjusting the requirements involve fewer costs. From the perspective of Lean management, this case study shows the necessity of balancing costs between the cost savings of applying the Lean philosophy and the value of being flexible to respond to the changing needs of customers. The perspective of transaction management can add that the balance between self-producing and domestic or foreign outsourcing depends on the asset specificity of the product. There is a trade-off between different types of transaction costs where the costs of coordination, the costs of lowering the lead time and the costs of building up an efficient trust relationship are to be balanced with each other.

Gabriel (1997) shows how the Lean philosophy has proven useful in project management. He describes two major building projects in the public domain in the United Kingdom: the construction of a new wing at the National Gallery and the new Glyndebourne Opera House. Both projects are organized in such a way that the communication lines are as short as possible. Project managers were employed by the clients, but each operated the projects as independently as possible. In addition, the project teams consisted of representatives of all the contractors and subcontractors who were responsible for their parts of the projects. This project teams looked after the necessary budgets and deadlines. This method of organization made sure that no unnecessary loss through miscommunication and misunderstandings occurred. This example of Lean project management is consistent with the finding of transaction management that insight into the interests of various stakeholders and organizing discourse between the many interested parties may lead to a compromise, which can save on transaction costs. This is in some way related to the Dutch way of organising compromise in the institutional setup of the so called Polder-model. The main, from this perspective relevant institution here is the Social Economic Council (SER), a tripartite body where representatives of employers organisations, trade unions and independent members advise the government on policy proposals. The discussions and will to come to a compromise agreement in the council lead to a considerable reduction of transaction costs in the implementation of policy (Den Butter and Mosch, 2003).

The principles of Lean management are also criticized in the literature. Cox and Chicksand (2005) indicate how in the process of food and meat production, and in the links of this production chain with retailers, the application of Lean management can be problematic. For individual firms, Lean management principles may be profitable, but for the production chain as a whole there are disadvantages. The reason is that in the production chain the customers, which in this case are the retailers, obtain too much

power. This makes the suppliers too dependent so that they are no longer able to organize their productions in an optimal way. Cox and Chicksand illustrate this phenomenon by the supply of fresh and frozen meat in the United Kingdom. In fact, the question here is about the distribution of added value in the production chain. Transaction management can in such cases exploit modern theories about the organization of production and trade (Antràs and Rossi-Hansberg, 2009). From a societal perspective, it is important that all parts of the production chain are linked in an optimal way at the lowest possible costs in the long run, and that the aim to reduce the outsourcing costs of production in the short run through negotiating sharp contracts with suppliers does not bring about high transaction costs in the long run because the suppliers are no longer able to comply with the contracts. This means that the orchestrator in the production chain, for example in the way IHC fulfils this role in the dredging industry, should ensure that the distribution of the profits from value creation in the chain takes place in an appropriate and fair manner. To give incentives to suppliers to provide innovative solutions during the full extent of the trade relationship, it is necessary that the proceeds from these successful solutions also accrue to those suppliers. This is the long-term perspective that the orchestrator should always respect and for which transaction management provides the arguments.

One of the most underrated aspects of Lean management is that much time is required for cultural changes to be fully effectuated. Cultural changes are an important prerequisite to adjusting the organization of production within a firm in order to adapt to changing circumstances. This is what Kaizen emphasizes in the Lean approach. It is obvious that the way these gradual changes in the business organization are realized, or rather provoked, depends on the cultural background of employees in the firm. In an Eastern-oriented business, a successful strategy might be different compared with where Western mentality and standards apply. In transaction management, the costs incurred by the transition from one organization of production to another are part of the overall transaction costs. These costs may relate to the cost of the transition to a different standard. However, bridging cultural differences is also a concern for transaction management. In this sense, transaction management complements the concept of Kaizen and the resulting implications for HRM. In this respect Beauvallet and Houy (2010) argue in their survey on Lean HRM that the Toyota model may not have a universal relevance and that the Scandinavian and German production models may act as a counterexample. The upshot is that firms must organise themselves in accordance with the economic and social context in which they evolve and hence define their own “productive model”. This is also true for the transition to a new way of organising production. Of course, the cultural component in the transition costs is difficult to quantify and such a transition requires responsible management.

Another aspect of Lean HRM, which can lead to a reduction of transaction costs, is concerned with the relationship between operators and managers in the production process. Managers should inspire operators not to be content with performing their production tasks as they are, but to be eager to submit proposals to improve the process. This is especially true if problems arise in the production line. Operators should look for the reasons of faults. It is related to the Lean strategy of Right First Time (RFT). RFT is defined as the willingness by a firm to deal with faults immediately when they arise and hence control its processes perfectly. It implies that the incentives for the operators should be to detect faults and inefficiencies, and not to hide them or cover them up, because of the fear that openness on faults and inefficiencies will lead to loss

of face. Obviously, the way the management is to get these incentives right will much depend on the cultural background of the personnel.

6. Conclusion

Lean management is a well-established method for organizing the production process. Torremans (2008) conducted a survey of 64 organizations that had implemented Lean management in the Netherlands. It suggests that Lean management is particularly suited for the establishment of production processes for what transaction cost economics considers products or services with high “asset specificity”. This illustrates how Lean management and transaction management are related to each other. In both cases, there is a strong focus on cost reduction within the production chain. Yet the difference here is that Lean management focuses on all costs in the production process, whereas transaction management focuses specifically on the transaction costs that the organization of production brings about. Both approaches have different backgrounds. Transaction management does not label itself as a management technique, but rather as a way of thinking that provides a practical application of recent developments in trade theory, and in the theories of institutional economics and industrial organization. Lean management stems directly from the practice of the organization and is an elaboration of how Toyota successfully organized its supply chain and production processes.

Nevertheless, both methods have a lot to offer one another as complementary approaches. They partly even overlap, though a different mindset and contrasting terminology are used. However, there are also significant differences in the way both methods balance costs, for instance between one-off and recurrent costs, between costs in the short run and long run and between costs associated with risks and expenses to avoid risks. Moreover, transaction management makes an important distinction between vertical costs (through the hierarchy within the firm) and horizontal costs (through the market). This distinction is particularly relevant for the make or buy and location decisions for outsourcing. Lean management places great emphasis on avoiding unnecessary costs, and on the extent to which costs are needed to generate value for the customer. Especially because of these differences, both methods can be regarded as to complement one another. Yet admittedly, Lean management has already earned its spurs, whereas transaction management has still to be proven profitable in such applications.

The human aspect forms another important issue on which the two methods complement each other. One of the elements that Lean considers "wasteful" is the overloading of staff; it is called muri. In transaction management, the human factor plays an implicit role in soft transaction costs. For example, in procurement various dimensions of sustainability play important roles in strategic decision making within the firm. Soft transaction costs also include the costs of unhappy staff. Lean makes this aspect more explicit by referring to the costs of such frustration in case transactions are poorly organized. This may apply to both government and industry. Another overlap relates to the seven types of waste Lean distinguishes, namely transportation, waiting, overproduction, defects, relocation, stocks and additional processing. These concepts, which in Lean are strongly associated to the production process, can also be applied on a more abstract level to transactions. This can provide a helpful tool for the relevant categorization of transactions and thereby a distinction between various types of transaction costs.

Both Lean and transaction management try to avoid unnecessary costs ("waste"), but whereas Lean is focused in particular on costs within an organization, transaction management seeks to organize the whole production chain at the lowest costs. Looking beyond the walls of the firm, as transaction management does, may even reduce costs within the walls of the firm. The fact that a transaction is executed in a certain way may create waste in the organization, such as an unnecessary stock. Now all effort can be made to minimize the inventory within the firm, but it seems better to coordinate the transaction with the customer or supplier. Here, the risk of Lean is to be "penny-wise, pound-foolish": when the organization is made "Lean", circumstances may change so that waste is created again. This can happen in times of crisis, allowing organizations to fall back into old habits. From that perspective, transaction management states that all partners in the supply chain should discuss the optimization of the transaction together. When such an orchestration of the supply chain is performed within an organization, the introduction of Lean in that organization is bound to be easier. The people doing the work best know what is possible and what is not. They are also the best to know the implications of changes to their work

All in all it seems that Lean is a wonderful philosophy to eliminate all forms of waste within the firm, whereas transaction management focuses on the links between organization of production within the firm and the outside options in a globalizing world. It implies that there are, as indicated above, differences in the strategic horizon of the two methods: the major concern for Lean is the internal organisation of the firm whereas transaction management mainly considers the external repercussions of decisions about how to produce. In that sense Lean and transaction management complement each other very well. As yet there are no cases available where both methods are applied in combination. Therefore, in order to obtain a better understanding of how combining both methods can be exploited in the best possible way, it is essential to avail of such practical cases. Hopefully that practical experience can now be gained as quickly as possible.

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